

## Shepherd 1974

- The Aub 623 source was developed by Ray Shepherd from a cross of Wild Mexican by Clewewilt 6-8.
- Auburn 623 was a transgressive segregate in later generations.
- Shepherd Manuscript Data
  - Wild Mexican Gall score 2.2
  - Clewewilt Gall score 3.5
  - *G. barbadense* RNR 1.1
  - Auburn 623 Gall score 1.0

# Hypothesis

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- There are at least 2 major genes involved in root knot resistance in the Auburn 623 source.
- One gene is on chromosome 14 and linked to the marker BNL 3545. This gene is present in Wild Mexican Jack Jones.
- One gene is on chromosome 11 and linked to the marker Cir 316a. This gene is present in Clewewilt and Nemx.
- There are probably additional modifier genes

# Markers

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- Marker Chromo Res Sus
- Allele Code Allele Code
- BNL 3545 14 118 A 138 B
- Cir 316a 11 200 A 188 B

# RKN MARKERS

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	<b>Chr 14</b>	<b>Chr 14</b>	<b>Chr 11</b>	<b>Chr 11</b>
	<b>B 3545</b>	<b>B 3545</b>	<b>C 316a</b>	<b>C 316a</b>
<b>Cotton</b>	<b>R = 118</b>	<b>S = 138</b>	<b>R = 200</b>	<b>S =188</b>
<b>Line</b>	<b>Code A</b>	<b>Code B</b>	<b>Code A</b>	<b>Code B</b>
<b>ST 213</b>		<b>138</b>		<b>188</b>
<b>M 8</b>		<b>138</b>		<b>188</b>
<b>Aub 56</b>		<b>138</b>		<b>188</b>
<b>Sus Iso</b>		<b>138</b>		<b>188</b>

# RKN MARKERS ACROSS LINES

JNJ RKN 2007 Parents

	<b>Chr 14</b>	<b>Chr 14</b>	<b>Chr 11</b>	<b>Chr 11</b>
	<b>B 3545</b>	<b>B 3545</b>	<b>C 316a</b>	<b>C 316a</b>
<b>Cotton</b>	<b>R = 118</b>	<b>S = 138</b>	<b>R = 200</b>	<b>S =188</b>
<b>Line</b>	<b>Code A</b>	<b>Code B</b>	<b>Code A</b>	<b>Code B</b>
<b>Wild Mx</b>	<b>118</b>			<b>190</b>
<b>Cleviewlt</b>		<b>138</b>	<b>200</b>	
<b>Nemx</b>		<b>138</b>	<b>200</b>	

# RKN MARKERS ACROSS LINES

JNJ RKN 2007 Parents

	<b>Chr 14</b>	<b>Chr 14</b>	<b>Chr 11</b>	<b>Chr 11</b>
<b>Cotton</b>	<b>B 3545</b> <b>R=118</b>	<b>B 3545</b> <b>S = 138</b>	<b>C 316a</b> <b>R = 200</b>	<b>C 316a</b> <b>S= 188</b>
<b>Line</b>	<b>Code A</b>	<b>Code B</b>	<b>Code A</b>	<b>Code B</b>
<b>M 240</b>	<b>118</b>		<b>200</b>	
<b>M 315</b>	<b>118</b>		<b>200</b>	
<b>Aub 623</b>	<b>118</b>		<b>200</b>	
<b>Aub 634</b>	<b>118</b>		<b>200</b>	
<b>Res Iso</b>	<b>118</b>		<b>200</b>	

# Crosses for RIL

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- **Clevewilt x St 213**
- **Clevewilt x M 240**
- **M 240 x ST 213**

# Cleviewilt x ST 213 Markers

JNJ RKN 207 RIL

<b>CHR 14</b>	<b>CHR 11</b>	<b>No. Plants</b>	<b>Gall Score</b>	<b>Eggs/PL</b>
<b>B</b>	<b>A</b>	<b>39</b>	<b>3.1</b>	<b>11,207</b>
<b>B</b>	<b>B</b>	<b>25</b>	<b>3.9</b>	<b>36,503</b>



# Cleviewilt x M 240 Markers

JNJ RKN 2007 RIL

<b>CHR 14</b>	<b>CHR 11</b>	<b>No. Plants</b>	<b>Gall Score</b>	<b>Eggs/PL</b>
<b>A</b>	<b>A</b>	<b>25</b>	<b>2.2</b>	<b>3,742</b>
<b>B</b>	<b>A</b>	<b>37</b>	<b>2.4</b>	<b>12,019</b>

# M 240 x ST 213 Markers

JNJ RKN 2007 RIL

<b>CHR 14</b>	<b>CHR 11</b>	<b>No. Plants</b>	<b>Gall Score</b>	<b>Eggs/PL</b>
<b>A</b>	<b>A</b>	<b>24</b>	<b>2.6</b>	<b>3,133</b>
<b>A</b>	<b>B</b>	<b>20</b>	<b>3.2</b>	<b>5,047</b>
<b>B</b>	<b>A</b>	<b>34</b>	<b>2.9</b>	<b>8,606</b>
<b>B</b>	<b>B</b>	<b>31</b>	<b>3.7</b>	<b>15,318</b>

# Cleviewilt x ST 213 Regression

JNJ RKN 2007 RIL

		<b>Gall Scr</b>	<b>Gall Scr</b>	<b>% Reduce</b>
<b>Marker</b>	<b>R 2</b>	<b>A</b>	<b>B</b>	
<b>316a</b>	<b>32.1**</b>	<b>3.07</b>	<b>3.89</b>	<b>20</b>
		<b>Eggs/PI</b>	<b>Eggs/PI</b>	
<b>316a</b>	<b>30.8**</b>	<b>11,206</b>	<b>35,868</b>	<b>69</b>

# Cleviewilt x M240 Regression

JNJ RKN 2007 RIL

		<b>Gall Scr</b>	<b>Gall Scr</b>	<b>% Reduce</b>
<b>Marker</b>	<b>R 2</b>	<b>A</b>	<b>B</b>	
<b>3545</b>	<b>6.1*</b>	<b>2.16</b>	<b>2.44</b>	<b>12</b>
		<b>Eggs/PI</b>	<b>Eggs/PI</b>	
<b>3545</b>	<b>26.4**</b>	<b>3,742</b>	<b>12,019</b>	<b>69</b>

# M240 x ST 213 Regression

JNJ RKN 2007 RIL

		<b>Gall Scr</b>	<b>Gall Scr</b>	<b>% Reduce</b>
<b>Marker</b>	<b>R 2</b>	<b>A</b>	<b>B</b>	
<b>3545</b>	<b>9.8**</b>	<b>2.9</b>	<b>3.3</b>	<b>12</b>
<b>316a</b>	<b>29.3**</b>	<b>2.8</b>	<b>3.5</b>	<b>20</b>
		<b>Eggs/PI</b>	<b>Eggs/PI</b>	
<b>3545</b>	<b>11.8**</b>	<b>4,000</b>	<b>11,807</b>	<b>66</b>
<b>316a</b>	<b>4.8*</b>	<b>6,341</b>	<b>11,288</b>	<b>44</b>

# M 240 x ST 213 Multiple Reg Markers 3545 and 316a

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- | • Trait      | $R^2$   |
|--------------|---------|
| • Gall Index | 38.4%** |
| • Eggs/Plant | 16.3%** |